

Claims

1 1. A submersible gas compressor comprising:
2 a ceramic high pressure piston in contact with a ceramic sleeve;
3 a drive piston mounted to said ceramic high pressure piston such that
4 movement of said drive piston simultaneously moves said ceramic high
5 pressure piston; and
6 a crank in mechanical connection with said drive piston.

1 2. The compressor of claim 1 further comprising a thermal
2 immersion tank comprising a liquid heat transfer fluid.

1 3. The compressor of claim 1 further comprising a compliant
2 coupling between said ceramic high pressure piston and said drive piston.

1 4. The compressor of claim 1 wherein said crank has a double
2 hung shaft operating independent of cantilever motion.

1 5. The compressor of claim 1 wherein said ceramic high pressure
2 piston contacts said ceramic sleeve independent of a lubricating liquid.

1 6. The compressor of claim 1 wherein the reciprocating movement
2 of said drive piston cycles between 600 and 800 cycles per minute.

1 7. The compressor of claim 2 wherein the liquid heat transfer fluid
2 is an aqueous solution.

1 8. A gas delivery system comprising:
2 a first stage compressor pressurizing an inlet gas to between 90 and
3 500 psig;
4 a first absorption bed comprising a molecular sieve material in fluid
5 communication with said first stage compressor, said absorbent bed enriching
6 an exiting gas stream in at least one inlet gas component;
7 a second stage compressor immersed in a liquid heat transfer fluid,
8 compressing the exiting gas stream to a pressurized gas stream having a
9 pressure of between about 5000 and 10,000 psig;
10 a cascade system for storing the pressurized gas stream at a pressure
11 between about 3500 and 5000 psig;
12 a control system in operational control of at least one of said first stage
13 compressor, said absorbent bed, said second stage compressor and said cascade
14 system; and
15 an outlet for delivering said pressurized gas stream.

1 9. The gas delivery system of claim 8 wherein said molecular sieve
2 is type 5A and said at least one inlet gas component is oxygen.

1 10. The gas delivery system of claim 8 further comprising a
2 blending valve interspersed between said absorbent bed and said second stage
3 compressor for delivering in combination the exiting gas stream and the inlet
4 gas.

1 11. The gas delivery system of claim 8 further comprising at least
2 one monitoring device selected from the group consisting of: pressure gage,
3 oxygen concentration gage, and thermocouple, coupled to said cascade system
4 and providing data to said control system.

1 12. The gas delivery system of claim 8 further comprising a
2 blending valve in fluid communication with said outlet and the inlet gas for
3 delivering in combination pressurized gas stream and outlet gas.

1 13. The gas delivery system of claim 8 further comprising a second
2 absorption bed.

1 14. The gas delivery system of claim 13 wherein the first absorption
2 bed is connected in series with the second adsorption bed.

1 15. The gas delivery system of claim 13 wherein the first absorption
2 bed is connected in parallel with the second adsorption bed.